CampbellReith
consulting engineers

Flat 1, 11 Glenilla Road, London NW3 4AJ

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12466-24

Revision: F1

April 2017

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Appendix

1.0 NON-TECHNICAL SUMMARY

1.1. CampbellReith was instructed by London Borough of Camden, (LBC) to carry out an audit on the revised Basement Impact Assessment submitted as part of the Planning Submission documentation for Flat 1, 11 Glenilla Road, London, NW3 4AJ (planning reference 2016/5528/P). The basement is considered to fall within Category B as defined by the Terms of Reference.

1.2. The Audit reviewed the Basement Impact Assessment for potential impact on land stability and local ground and surface water conditions arising from basement development in accordance with LBC's policies and technical procedures.

1.3. CampbellReith was able to access LBC's Planning Portal and gain access to the latest revision of submitted documentation and reviewed it against an agreed audit check list.

1.4. A revised BIA was undertaken by INGealtoir in conjunction with Southern Testing and Tully De'ath in order to produce the necessary information to meet the requirements of CPG4. The various authors of the individual reports possess the relevant qualifications.

1.5. The existing building is a three storey terraced house with a partial shallow basement and rear ground floor extension. It is proposed to construct a deeper basement over the full ground floor footprint, including rear extension, and form front and rear lightwells. No.13 Glennilla Road is currently constructing a similar basement to that proposed for no.11.

1.6. Soils testing has determined that the basement will be founded within London Clay and that perched groundwater is likely to be encountered in the Made Ground and Head Deposits above. Groundwater monitoring has taken place and any ingress into excavations should be controllable by sump pumping.

1.7. The basement will be constructed using conventional underpinning of loadbearing/Party Walls and reinforced concrete retaining walls to form front and rear lightwells. Acceptable construction information has been provided for the temporary and permanent works.

1.8. A Ground Movement Assessment was carried out by Southern Testing and a maximum Category 1 damage is predicted for the neighbouring properties. Mitigation measures are provided.

1.9. Movements affecting Glenilla Road due to the construction of the proposed basement are included. It is proposed to consult the Highways Department on the most appropriate mitigation and remedial works, as necessary.

1.10. A standardised Party Wall movement monitoring pro-forma has been provided which needs to be developed and agreed as part of the Party Wall Approval procedure.

1.11. A Flood Risk Statement shows that the development generates negligible flooding risk to the sewer network but suggests several mitigation measures to prevent flooding of the basement which should be incorporated into the detailed design proposals and these are endorsed.

1.12. It is accepted that there are no hydrogeological or slope stability concerns caused by the development to the surrounding area.

1.13. Queries and requests for clarification are discussed in Section 4 and summarised in Appendix 2. Considering the revised submissions, the BIA is considered to meet the criteria of CPG4.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 28 October 2016 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for Flat 1, 11 Glenilla Road, London, NW3 4AJ.

2.2. The Audit was carried out in accordance with the Terms of Reference set by LBC. It reviewed the Basement Impact Assessment for potential impact on land stability and local ground and surface water conditions arising from basement development.

2.3. A BIA is required for all planning applications with basements in Camden in general accordance with policies and technical procedures contained within

- Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.
- Camden Planning Guidance (CPG) 4: Basements and Lightwells.
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water.

2.4. The BIA should demonstrate that schemes:

a) maintain the structural stability of the building and neighbouring properties;

b) avoid adversely affecting drainage and run off or causing other damage to the water environment;

c) avoid cumulative impacts upon structural stability or the water environment in the local area, and;

evaluate the impacts of the proposed basement considering the issues of hydrology, hydrogeology and land stability via the process described by the GSD and to make recommendations for the detailed design.

2.5. LBC's Audit Instruction described the planning proposal as *"Excavation to enlarge existing basement including installation of front and rear lightwells and extension to existing part width ground floor rear projection with revised fenestration."*

The Audit Instruction also confirmed that the basement proposal does not involve a listed building nor does the site neighbour any listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 16 November 2016 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment dated August 2016 by Gledsdale Associates Consulting Structural Engineers,
- Design, Access and Heritage Statement dated September 2016 by Strange Associates,
- Geotechnical Survey Report dated June 2016 by Fasttrack,
- Arboricultural Report dated July 2016 by Tim Moya Associates, and
- Planning Application Drawings dated August 2016 by Gledsdale consisting of:
- Existing Plans, Elevations and Sections
- Proposed Plans, Elevations and Sections

2.7. Following the issue of CampbellReith's audit report in November 2016, a revised Basement Impact Assessment was submitted to LBC in order to respond to the comments and concerns identified. The following information has been provided for audit purposes:

- Basement Impact Assessment dated March 2017 by INGealtoir Consulting Structural Engineers and Appendices
- Appendix 1 – Basement Impact Assessment (Stages 1 to 4) dated 27 March 2017 by Southern Testing
- Appendix 2 – Geotechnical Report undated by INGealtoir
- The Southern Testing BIA includes a Flood Risk Statement dated 15 March 2017 by Tully De'ath as its Appendix F

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	BIA Summary.
Is data required by Cl.233 of the GSD presented?	Yes	BIA, Sections 1 to 14.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	
Are suitable plan/maps included?	Yes	BIA, Appendix A.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA, Section 17.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA, Section 16.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA, Section 15.
Is a conceptual model presented?	Yes	
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA, Review of Stage 2 Scoping Exercise.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA, Review of Stage 2 Scoping Exercise.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA, Review of Stage 2 Scoping Exercise.
Is factual ground investigation data provided?	Yes	BIA, Appendix B.
Is monitoring data presented?	Yes	BIA, Section 29.
Is the ground investigation informed by a desk study?	Yes	BIA, Section 22.
Has a site walkover been undertaken?	Yes	BIA, Section 23.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	BIA, Sections 12 and 14.
Is a geotechnical interpretation presented?	Yes	BIA, Section 28.
Does the geotechnical interpretation include information on retaining wall design?	Yes	BIA, Section 33.
Are reports on other investigations required by screening and scoping presented?	Yes	Arboricultural Report.
Are the baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	Yes	BIA, Review of Stage 2 Scoping Exercise.

Item	Yes/No/NA	Comment
Are estimates of ground movement and structural impact presented?	Yes	BIA, Section 37-43.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	Discussed in principle.
Has the need for monitoring during construction been considered?	Yes	Standard monitoring specification.
Have the residual (after mitigation) impacts been clearly identified?	Yes	Will be incorporated into detailed design as identified in ING BIA, Section 6 and Flood Risk Statement.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	BIA, Section 37-43.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	Flood Risk Statement.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	BIA, Section 37-43.
Are non-technical summaries provided?	No	However, reports are easily understood.

4.0 DISCUSSION

4.1. The revised Basement Impact Assessment has been carried out by INGealtoir Consulting Structural Engineers, who have produced structural permanent and temporary works drawings, retaining wall calculations, specifications for the basement works and a movement monitoring procedure. They have included as their Appendix 1, a Basement Impact Assessment (BIA) carried out by Southern Testing to produce the BIA Stages 1 to 4 to include Screening and Scoping Assessments required by CPG4, as well as a Ground Movement Assessment. Within this Southern Testing document is a Flood Risk Statement, undertaken by Tully De'ath, as its Appendix F. Although the required documentation is contained within a number of separate reports, it is clearly identified and is non-contradictory. The authors of the various reports have suitable qualifications in accordance with the requirements of CPG4.

4.2. The Screening and Scoping review exercise identified in Section 3 references the various sections contained within the Southern Testing BIA. Where the other reports have been used to identify responses, they are specifically referred to within the commentary table. All responses are generally acceptable.

4.3. The existing building comprises a three storey terraced house with a partial basement and a single storey extension. The proposal seeks to deepen the existing foundations to approximately 3.5m and extend the basement beneath the entire ground floor footprint, including the extension, and form front and rear lightwells. The property shares Party Walls with nos. 9 and 13 Glenilla Road; no.9 is a mirror image of no.11 and no.13 is currently constructing a similar basement to no.11.

4.4. Southern Testing have carried out a soils investigation by undertaking a borehole and two trialpits within the property. These have identified Made Ground and Head Deposits above London Clay and the BIA has identified a bearing pressure of 125 KN/m^2 to form the new basement. Monitoring of groundwater was carried out on three occasions and it is accepted that, although ingress can be expected in the Made Ground, this should be controllable using normal pumping techniques. It is also accepted that any localised effect on groundwater levels due to basement pumping will be negligible.

4.5. The INGealtoir Geotechnical Report proposes to construct the basement using conventional underpinning techniques for which they have provided an underpinning bay layout, construction details and an indicative temporary works solution, all of which are acceptable.

4.6. A Ground Movement Assessment (GMA) is presented in the revised BIA which determines the vertical and horizontal movements in relation to their impact on the neighbouring properties and the adjacent highway using Oasys XDisp software. The GMA also considers the combined effect of the recent basement construction at no.13 and the proposed basement at no.11. The

GMA includes an assessment of the likely heave as a result of basement construction activities using Oasys PDisp software.

4.7. The GMA states that the underpinned sections of the new basement have been treated as piles. However, movements resulting from the underpinning operations considers the installation of underpins and the excavation in front of them. This methodology is accepted. Contour plots, displacement graphs and full input and output from both PDisp and XDisp were presented.

4.8. A maximum of Category 1 (Very slight) damage has been predicted for both no.9 and no.15 Glenilla Road when considering the combined effects of basements constructed at no.11 and no.13 Glenilla Road. Mitigation measures are proposed in Section 42 of the BIA.

4.9. An assessment of the impacts on Glenilla Road is presented in Section 42 of the BIA. The Highways Department should be consulted in relation to predicted movements and any mitigation measures required.

4.10. Retaining wall calculations have been produced by INGealtoir using geotechnical parameters provided by Southern Testing, all of which are acceptable.

4.11. A Party Wall movement monitoring pro-forma has been provided by INGealtoir which needs to be developed and agreed as part of the Party Wall Approval procedure.

4.12. The Flood Risk Statement (FRS) prepared by Tully De'ath identifies that there is an increase of $12m^2$ of impermeable paved area and it is accepted that the new low level courtyard generates a negligible flood risk to the sewer network. The FRS states that to mitigate against the risk of the sewer flooding the proposed basement, non-return valves should be installed into the pipework. The drainage system should also incorporate SuDS features to reduce the impact on the existing sewerage system. It also recommends that courtyard walls should be designed as a waterproof structure. These mitigation measures should be incorporated into the detailed design proposals.

4.13. It is accepted that the basement of no.11, together with that of no.13 currently under construction, will not produce a detrimental cumulative impact on the water environment in the local area.

4.14. It is accepted that there are no slope stability concerns caused by the proposed development.

5.0 CONCLUSIONS

5.1. A revised BIA was undertaken by INGealtoir in conjunction with Southern Testing and Tully De'ath in order to produce the necessary information to meet the requirements of CPG4. The various authors of the individual reports possess the relevant qualifications.

5.2. The existing building is a three storey terraced house with a partial shallow basement and rear ground floor extension. It is proposed to construct a deeper basement over the full ground floor footprint, including rear extension, and form front and rear lightwells. No.13 Glenilla Road is currently constructing a similar basement to that proposed for no.11.

5.3. Soils testing has determined that the basement will be founded within London Clay and that perched groundwater is likely to be encountered in the Made Ground and Head Deposits above. Groundwater monitoring has taken place and any ingress into excavations should be controllable by sump pumping.

5.4. The basement will be constructed using conventional underpinning of loadbearing/Party Walls and reinforced concrete retaining walls to form front and rear lightwells. Acceptable construction information has been provided for the temporary and permanent works.

5.5. A Ground Movement Assessment was carried out by Southern Testing and a maximum Category 1 damage is predicted for the neighbouring properties. Mitigation measures are provided.

5.6. Movements affecting Glenilla Road due to the construction of the proposed basement are included. It is proposed to consult the Highways Department on the most appropriate mitigation and remedial works, as necessary.

5.7. A standardised Party Wall movement monitoring pro-forma has been provided which needs to be developed and agreed as part of the Party Wall Approval procedure.

5.8. A Flood Risk Statement shows that the development generates negligible flooding risk to the sewer network but suggests several mitigation measures to prevent flooding of the basement which should be incorporated into the detailed design proposals and these are endorsed.

5.9. It is accepted that there are no hydrogeological or slope stability concerns cause by the development to the surrounding area.

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

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Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Stability	Geotechnical design information for retaining wall design and long term groundwater monitoring.	Closed - Provided in revised BIA	April 2017
2	Stability	Retaining wall calculations to form lightwells.	Closed - Provided in revised BIA	April 2017
3	Stability	Results of trial pits.	Closed - Provided in revised BIA	April 2017
4	Stability	Underpinning bay layout.	Closed - Provided in revised BIA	April 2017
5	Stability	Indicative temporary works proposal.	Closed - Provided in revised BIA	April 2017
6	Stability	Construction sequence drawings.	Closed - Provided in revised BIA	April 2017
7	Stability	Ground movement analysis plus mitigation.	Closed - Provided in revised BIA	April 2017
8	Stability	Details to constrain heave pressures.	Closed - Provided in revised BIA	April 2017
9	Stability	Movement monitoring proposals.	To be agreed during Party Wall process	Note
10	Stability	Details of adjacent basements.	Closed - Provided in revised BIA	April 2017
11	Format	Evidence to demonstrate adequate experience and further revision to include commentary from authors meeting CPG4 requirements.	Closed - Provided in revised BIA	April 2017
12	Slope Stability	Enhanced responses to Screening Q5, Q8, Q12 and Q13.	Closed - Provided in revised BIA	April 2017
13	Surface Flow and Flooding	Enhanced response to Screening Q2, Q3, Q4 and Q6.	Provided in revised BIA but FRS mitigation measures to be incorporated into final design	Note
14	Subterranean (Groundwater Flow)	Enhanced responses to Screening Q1b, Q2, Q4 and Q5.	Closed - Provided in revised BIA	April 2017

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Appendix 3: Supplementary Supporting Documents

Basement Impact Assessment dated March 2017
by INGealtoir and Appendices

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